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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,784	10/10/2000	Miguel Philipe Paul Peeters	1875.5450000	4881

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WASHINGTON, DC 20005

EXAMINER
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WANG, TED M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/686,784

Applicant(s)

PEETERS, MIGUEL PHILIP  
PAUL

Examiner

Ted M Wang

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-20 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, filed on 10/13/2004, with respect to the rejection(s) of claim(s) 1-20 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Watanabe (US 5,432,632).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1, 3-6, 10-15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) in view of Watanabe (US 5,432,632).

- In regard claim 1, Timm et al. discloses a multimode digital modem for demodulating a multi-tone, multi-band signal (column 17 lines 57-67, Fig. 6c) using an inverse discrete Fourier transform or inverse fast Fourier transform to generate a signal having plurality of tones spaced in frequency in a plurality of frequency bands (Fig.6d element 640, and column 18 lines 1-2, column 47 line 29 – column 48 line 16), comprising a plurality of demodulators demodulates one of the plurality of frequency band of the multi-tone, multi-band signal (column 47 line 29 – column 48 line 16), and wherein each demodulator includes a discrete Fourier transform module that performs a discrete

Fourier transform on the plurality of tones within one of the plurality of frequency band (Fig.6d element 666, and column 18 lines 1-20, and column 46 line 37 – column 48 line 16). Timm et al. discloses all of subject matter as described in the above paragraph except for specifically teaching that a receiver comprises a plurality of demodulators, wherein each of the plurality of demodulators demodulates a different one of the plurality of frequency bands signal.

However, Watanabe teaches a receiver comprises a plurality of demodulators, wherein each of the plurality of demodulators demodulates a different one of the plurality of frequency bands signal (Fig.4 element 410-1 – 410-N, Fig.5, Fig.6, and column 5 line 27 – column 6 line 40).

It is desirable to have a receiver comprising a plurality of demodulators, wherein each of the plurality of demodulators demodulates a different one of the plurality of frequency bands signal in order to reduce the system cost (column 6 lines 41-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Watanabe in which, a receiver comprising a plurality of demodulators, wherein each of the plurality of demodulators demodulates a different one of the plurality of frequency bands signal, into Timms' demodulation circuit so as to reduce the system cost.

- In regard claim 3, Timm et al. further discloses that each demodulator further includes an equalizer connected to the output of the discrete Fourier transform in column 3 lines 19-23.

- In regard claim 4, Timm et al. further discloses the limitation that each demodulator further includes a filter for filtering the received signal prior to the discrete Fourier transform in Fig.6d element 660.
- In regard claim 5, Timm et al. further discloses that a transceiver including a receiver according to claim 1 in Fig. 14a, 14c, and 14d.
- In regard claim 6, Timm et al. further discloses that each demodulator includes an echo canceller for removing an echo associated with a signal in a transmitter of the transceiver from the received signal in Fig.4b element 327 and column 2 lines 64-66.
- In regard claim 10, Timm et al. further discloses that the multi-band signal is generated by filtering the output of the modulator in Fig.4a element 44.
- In regard claim 11, which is a method claim related to claim 1. All limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 12, which is a method claim related to claim 3. All limitation is contained in claims 3. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 13, which is a method claim related to claim 4. All limitation is contained in claims 4. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 14, which is a method claim related to claim 5. All limitation is contained in claims 5. The explanation of all the limitation is already addressed in the above paragraph.

- In regard claim 15, which is a method claim related to claim 6. All limitation is contained in claims 6. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 17, which is a method claim related to claim 10. All limitation is contained in claims 10. The explanation of all the limitation is already addressed in the above paragraph.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) and Watanabe (US 5,432,632) as applied above to claim 1, and further in view of Lee et al. (US 5,818,296).

- In regard claim 2, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that the process speed of each demodulator is determined by the respective frequency.

However, Lee et al., cited by the applicant, discloses a demodulator that the process speed of each demodulator is determined by the respective frequency (column 3 line 57 – column 4 line 13).

It is desirable that the process speed of each demodulator is determined by the respective frequency in order to speed up the subsequent demodulation processes (column 3 lines 57-65).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Lee et al. in which, a demodulator that the process speed of each demodulator is determined by the respective frequency, into Timm et al. and Watanabes' receiver so as speed up the subsequent demodulation processes.

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) and Watanabe (US 5,432,632) as applied above to claim 6, and further in view of Ho et al. (US 5,317,596).

- In regard claim 7, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that echo canceller is connected to remove the echo at the input to the discrete Fourier transform.

However, Ho et al. teaches that the echo canceller is connected to remove the echo at the input to the discrete Fourier transform (Fig.3 elements 100 and 56 and column 5 line 26 – column 6 line 25).

It is desirable that echo canceller is connected to remove the echo at the input to the discrete Fourier transform in order to provide an improved echo canceller that accurately estimates and eliminates unwanted echo present in full-duplex data communication channels (column 4 lines 3-6). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Ho et al. in which, echo canceller is connected to remove the echo at the input to the discrete Fourier transform, into Timm et al. and Watanabes' demodulation circuit so as to eliminates unwanted echo present in full-duplex data communication channels.

- In regard claim 8, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that each echo canceller comprises an adaptive filter.

However, Ho et al. teaches that each echo canceller comprises an adaptive filter (column 6 line 50 – column 7 line 4).

It is desirable that each echo canceller comprises an adaptive filter in order to improve the echo cancellation performance (column 7 lines 1-4). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Ho et al. in which, each echo canceller comprises an adaptive filter, into Timm et al. and Watanabes' demodulation circuit so as to improve the echo cancellation performance.

6. Claims 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) and Watanabe (US 5,432,632) as applied above to claims 1 and further in view of Agee (US 6,128,276).

- In regard claims 9 and 16, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that the signal is generated by nulling selected tones in the modulator.

However, Agee teaches that the signal is generated by nulling selected tones in the modulator (column 6 line 5-17 and column 9 lines 49-59).

It is desirable that that the signal is generated by nulling selected tones in the modulator to eliminate out-of-cell interference (column 5 lines 1-14). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Agee in which, the signal is generated by nulling selected tones in the modulator, into Timm et al. and Watanabes' modulator circuit so as to eliminate out-of-cell interference.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) and Watanabe (US 5,432,632) as applied above to claims 1, and further in view of Feher (US 6,470,055).



- In regard claim 18, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that the receiver comprises a splitter, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators.

However, Feher teaches a splitter, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators (Fig.36 element 36.2 and column 38 lines 43-52).

It is desirable to have a splitter, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators to improve the capacity of CDMA, TDMA, GSM, OFDM, FDM and other wireless and wired communications broadcasting. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Feher in which a splitter, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators, into Timm et al. and Watanabes' receiver so as to the capacity of CDMA, TDMA, GSM, OFDM, FDM and other wireless and wired communications broadcasting.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US 6,055,268) and Watanabe (US 5,432,632) as applied above to claims 1, and further in view of Kahre (US 5,680,388).

- In regard claim 19, Timm et al. and Watanabe disclose all subject matter as described in the above paragraph except for specifically teaching that the discrete Fourier transform module performs a discrete Fourier transform at sampling frequency ( $F_s$ ,  $k$ )

wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator.

However, Kahre teaches that the discrete Fourier transform module performs a discrete Fourier transform (Fig.2 element S) at sampling frequency ( $F_s, k$ ) wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator (Fig.2 element U, and column 4 lines 23-40).

It is desirable that the discrete Fourier transform module performs a discrete Fourier transform at sampling frequency ( $F_s, k$ ) wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator in order to improve the synchronization (column 4 lines 23-40).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by Kahre in which the discrete Fourier transform module performs a discrete Fourier transform at sampling frequency ( $F_s, k$ ) wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator, into Timm et al. and Watanabe's receiver so as to improve the synchronization.

- In regard claim 20, all limitation is contained in claims 19. The explanation of all the limitation is already addressed in the above paragraph.

### **Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M Wang whose telephone number is (571) 272-3053. The examiner can normally be reached on 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377

Ted M Wang  
Examiner  
Art Unit 2634

Ted M. Wang

A handwritten signature in cursive script, appearing to read 'Shuwang Liu', is written in black ink.

**SHUWANG LIU**  
**PRIMARY EXAMINER**